Bob Budnitz and the Beginnings of ESD

The Energy & Environment Division, whose predecessor came into being at LBL in June 1971, was not a division at first, only a program, but one that stood outside any existing division at that time. It came about because of the realization that there was a huge energy and environmental problem, and that the Lab collectively had a lot to contribute toward solving this problem. Ed McMillan, then Lab director, put two very prominent people in charge of this program, Jack Hollander and Andy Sessler (who became Lab Director two years later). Their mission was to see if they could develop projects and programs that would ultimately become a division. At the outset of this program, Hollander and Sessler sent out a lab-wide notice, calling for anyone who was interested in developing projects in this area to "give us a call." The original call sought ideas for environmental research, but the scope quickly broadened to include energy studies as well, based on the widespread interest in energy topics. Forty or fifty scientists responded with their ideas. Some proposals were for solar, some for geothermal, energy efficiency, chemical process development, environmental research, various things. Hollander and Sessler sorted these out, turned the best of them into proposals, and sent them off to various agencies—AEC (the precursor to DOE), NSF, NIH, State of California, and so forth. Within a year, we had a couple of million dollars and about 30 people working on a number of projects.

The first large project funded within the program, still in 1971, was headed by Paul Witherspoon, who (along with Harold Wollenberg) got $600,000 to do geothermal exploration. The second was an instrumentation effort that I was involved in, for about the same amount of money. By 1973, E&E's funding had doubled, we had about 40 people in E&E, and Andy Sessler had become the head of the Lab, in part because of the success of this program. So in a very short time we were a central focus for the Lab. Once he became Lab Director, Sessler promptly turned E&E into a division, with Jack Hollander as division director.

In 1975, Hollander got a great job offer from the National Academy of Sciences and left LBL, and Andy Sessler put me in as acting head of E&E. I was only 35 at the time and didn't want the job long term, so the Lab began a national search for someone to take over this division. By then, we had about 6–8 million to work with. After a whole year's search, the Lab had identified four or five good candidates for the job, a couple from inside LBL and a couple from outside. In the end, though, not a single person whom the Lab wanted would take the job, because E&E was too broad. By this time, 1976, E&E encompassed fusion (controlled nuclear reactions), geothermal, solar, energy engineering, energy analysis, environment, energy efficiency. So within five years, it had grown from not even division status to a division that was too broad.

The search committee recommended a reorganization to narrow the division, and then to search again for a director. So, in 1977, Sessler did indeed reorganize E&E.: he sent the fusion work of E&E back into the Lab's accelerator division, the E&E engineering component back into engineering, and kept the solar, energy efficiency, chemical-process, energy-analysis, and environmental programs within E&E (which over time evolved into the EETD). And, most importantly for our discussion, he broke off the geothermal and geosciences programs (then the Earth Sciences Program) into a new division, which was the birth of the Earth Sciences Division, with Paul Witherspoon as the lead.

There were several things going on at once that propelled this reorganization and justified the existence of a separate ESD. First, there was the urgent need to break E&E apart, because it was growing too fast to effectively manage. It was, by 1977, a 13 million dollar organization and soon to be 18 million. So there was enough internal growth to support the logic of a separate ESD. Initially, the big programs within ESD were the geothermal programs, including not only geothermal exploration but also geothermal engineering or utilization systems, the effort to develop turbines or materials that could cope with this nasty, corrosive fluid that would come out of the ground during geothermal exploration—and the radioactive waste storage program, which had gotten a big boost from the Stripa Mine characterization that started in 1977.

But beyond all that, one of the main forces behind ESD becoming a separate division was the leadership talent of Paul Witherspoon. Under his guidance, this group had become a coherent program with a coherent set of disciplines—geology, geophysics, geochemistry. Many different parts of earth sciences had started to become important. Andy Sessler knew that he had a leader in that group that could really lead, given the many projects that had already been nurtured and sustained under Paul. So this was a big factor in Sessler's decision to make Earth Sciences a separate division. If there hadn't been anyone like Paul there to lead the group, I'm not sure that things would have happened the way they did. He made the decision to make a new division an easy one. Paul Witherspoon also had the intellectual respect of all the other division heads.

Moreover, at the time E&E was wrestling with personnel issues. The lab traditionally had featured the disciplines of physics, chemistry, material sciences, the life sciences, but they didn't have many engineers, other than a lot of engineers who were doing engineering support work, people designing things to support the lab's other programs. There were few research engineers, and the Lab as a whole had virtually no one who did applied research, as opposed to basic research. Almost everything at the Lab, certainly at that time, was either basic research, or support engineering, or some combination. When I became head of E&E in 1975, we had a terrible problem with the rest of the Lab, because we were hiring in droves people from disciplines that the other divisions didn't know what to do with, or whether to take seriously. We hired architects, economists, engineers who did electrical systems work for BART. They were top people in their fields, Ph.D.'s who were doing research, but they weren't people from the scientific disciplines established at the Lab. Forexample, we hired an economist that we called an "engineer"; because that was the only category we could fit him into. I had to fight a battle to get those people job classifications that made sense and also to get them proper pay.

While this battle was very difficult for E&E, it was really not a problem for Earth Sciences. The earth sciences had recognized disciplines, it had academic departments down on campus, it had national associations. The people in ESD typically belonged to GSA, or AGU, they published in refereed journals. Almost nothing else within the rest of E&E was a recognized discipline. So ESD had legitimacy in the eyes of the other Lab divisions. ESD would thus have no trouble in establishing a job called, for example, a Ph.D. geologist, whereas as the head of E&E, I had to struggle to establish a job for, say, an energy economics analyst. There were no such departments on campus, no journals, no professional societies. Such a position wouldn't have a 100-year history within an academic discipline. In contrast, it was generally easy for the rest of the Lab to see earth scientists as colleagues. So this was another reason that making ESD a division was an

easy choice. Or to put it more precisely, other divisions, while not questioning the legitimacy or the credentials of these architects or economists, did not recognize their place in the Lab. When I was at E&E, we had these conflicts, which ESD never had.

Another key to Paul's success was his ability to bring in to the program about 10 very widely known earth scientists from the UC campus who became PIs or program leaders in ESD. The fact that many of them came from the Berkeley academic community made ESD all the more legitimate in the eyes of the rest of the Lab. Paul's clout brought in a lot of heavyweights. Also, with respect to the connection between the Lab and UC Berkeley, the Lab offered mechanism and funding for graduate students and post docs associated with these PI's, and these younger scientists quickly became familiar and involved with many long-term programs. The larger institution provided the stability that made them willing participants in these programs.

Also, Paul and these PIs he brought in had pipelines to significant long-term funding in Washington. This enabled the Lab director to say, "If we make a division of Earth Sciences, it's going to be here awhile." In contrast, there was significant doubt about the survival of the rest of E&E—not that the work wasn't important, but we didn't know whether those programs would have a 30-year life. (In fact, they have had, but we didn't know that at the time.) We had a suspicion that this might on the national level be a fad: AEC became ERDA as a result of the energy crisis related to the Middle East Oil Boycott, Rachel Carson's *The Silent Spring* came out, the environmental movement exploded in the 70s—what we were doing was to some extent related to these and other political or social issues. We simply didn't know if the funding associated with these issues would last beyond a few years.

So that's all part of the multi-tiered explanation for why ESD came into existence in 1977. Today, ESD can say that because of the intellectual coherence of the program, and the fact that there are recognized earth science disciplines in universities throughout the world, it quickly became a full-fledged sister division to the other divisions.

Looking back on ESD at the beginning, it was like one big party. Not that people goofed around, but it was a happy bunch, there was lots of good will, and of course more than sufficient funding doesn't hurt. True, there has always been the problem of space—in fact, the Lab has never found proper space for ESD or E&E (now EETD). Aside from that problem, though, there was always good energy in ESD. The leaders that Paul brought in, besides being top experts in their areas, were dynamic, friendly people. ESD was a popular place. People would come around from other parts of the lab and say, "Gee, you know, I'd like to work with you guys next year if you've got something."